

Reciprocating Compressor Asset Performance Management (APM)



Reciprocating compressors and engines have long been part of the oil & gas landscape. Operators run compression packages in natural gas gathering, processing, transmission, storage and CNG applications, with very different needs from their equipment. With BHGE's APM technology, operators can monitor the health and reliability of their equipment, increasing the life of and fully optimizing their package.

Reliability & Maintenance

Using the correct maintenance schedule and procedures is the best way to extend the life of reciprocating compression equipment, but how can an operator be sure they're addressing the correct issue during their scheduled service? Unplanned maintenance on a package can be costly, ranging from a few hundred thousand to millions of dollars a year in lost productivity, emergency service and expensive parts.

A common source of issues in reciprocating compressors is valve failure, attributed to 50-60% of compressor issues in multiple studies¹. With BHGE's Valve Performance App it's simple to address issues that could cause poor valve performance or failure, such as impact speed, late closing, or valve flutter. With this information, an operator can select to retrofit a new valve at a fraction of the cost of the unplanned maintenance incurred without, extending the life of the equipment, and saving costly downtime.

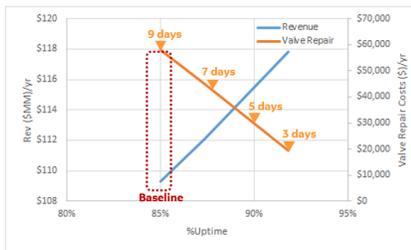
Benefits of APM

- Increased team productivity in managing assets
- Immediate reaction to asset events
- Faster return to service
- Improved asset availability and reliability through physics- and rule-based analytics

Benefits Analysis – Case Study

Key Assumptions

- Based on 15 units – 1500 HP, 10 MMSCFD per unit
- Baseline uptime of 85%
- 40% - 50% total downtime due to compressor
- Estimated maintenance costs 60% of total op expense
- Valve repair costs based on past failure analysis



Unplanned Maintenance Impact

- Reduce downtime 6 days (9 days to 3 days)
- Decrease valve repair costs/year & increase revenue

Apps to support early detection & proactive planning:

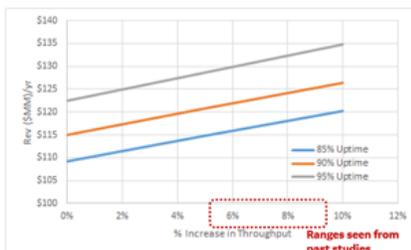
- Discharge temperature analysis
- PV analysis
- Valve performance analysis

Utilization Impact

- Increase uptime 10% (85%-95%)
- Increase throughput 6%-8% per asset

Digital Twin to support increase utilization:

- Flow optimization
- Real-time monitoring of key performance indicators
- Extend to fleet optimization



Offering: Base Package & Connectable Assets

BHGE offers a base package of Machine & Equipment Health Management, offering a web-based program with station & asset dashboards, instant data access & notifications, availability, reliability & uptime indicators, utilization & gas throughput indicators, diagnostic workbench, and manual data entry. Our package also offers rule-based analytics and custom key performance indicators manageable by the user. Base package is available as a standalone offering, or as part of a materials or service agreement.



Connection Requirements

APM module (part no. provided by BHGE)	Cellular router (procured locally)
Sim card with 250mb/month data plan by local cellular provider	Cell signal booster (if required)
Modbus TCP/IP or Modbus RTU communication network	Additional sensors may be needed for additional analytic apps

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